



**DISTRIBUTED**  
TCRM 9-14-15

## MEMO

TO: President and the Members of the Town Council  
FROM: Town Manager  
SUBJECT: Gas Monitoring Well Removal and Replacement  
DATE: September 14, 2015

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### **Background:**

The Town of Munster has a number of monitoring wells on and around Centennial Park. This is a requirement of the Indiana Department of Environmental Management (IDEM) due to the former nature of the park as a regulated landfill. These wells are monitored to gauge whether or not methane from the landfill is migrating from the site via groundwater.

One of these monitoring wells (MW-7) sits directly in the path of the path of the realigned 45<sup>th</sup> Street. The well needs to be removed and replaced in order for our project to move forward, as well as to remain compliant with IDEM.

### **Methodology:**

We hope to conduct the drilling work for the well abandonment and replacement well during the same drilling mobilization as a gas investigation at the southeast corner of the Munster Landfill, which was recently approved by IDEM. The enclosed maps show the MW-7 location with respect to site features (**Exhibit 1**) and recent groundwater elevation contours (**Exhibit 2**). The construction diagram for MW-7 is enclosed as **Exhibit 3**.

MW-7 will be abandoned by tremie-grouting a high-solids bentonite grout from the bottom of the well up to the ground surface, displacing water in the casing. The 2-inch PVC casing will be cut off two feet below ground surface and the borehole topped with medium-grade bentonite chips.

In addition to abandoning MW-7, and during the same drilling event, we will be replacing the well with a new up gradient monitoring well, MW-16. The proposed location is shown on **Exhibits 1** and **2**. This location may need to be changed if the proposed location encounters rubble or waste. If conditions indicate that the location should be moved more than 100 feet beyond the circle indicated in **Exhibit 1**, then IDEM will be consulted prior to constructing the well.

The target unit is the same uppermost sand unit monitored by most of the other monitoring wells in the network. At the proposed location, the estimated elevation for the screened interval is between 590 and 600 feet (above MSL). The well will have a ten-foot 0.01-inch slotted PVC screen and 2-inch diameter PVC casing with flush-threaded couplings. A filter pack that is 90% or greater retained by the slotted casing will be placed to within 2 feet above the top of the well screen. A minimum 1-foot bentonite pellet seal will be placed above the filter pack, and the



remainder of the annulus will be tremie-grouted with high solids bentonite grout to within 2 feet of the ground surface.

The well will be finished with a 2-foot x 2-foot concrete pad, metal protective casing, sand-filled annulus, drain hole, and lock. The PVC casing will have a vented cap and a surveyed marking on the casing lip. **Exhibit 4** is a schematic of the proposed well construction.

As in most all matters regarding the landfill monitoring, administration recommends utilizing Andrews Engineering for this work. Attached you will find their proposal letter as **Exhibit 5**. At the request of the Town Andrews solicited multiple bids for the drilling services. The successful bidder on that work was Environmental Drilling and Contracting of Holland, MI. The costs for these activities are detailed below:

	Gas Investigation	Gas Vents	MW-7 Remove and Replace	Management Fee	Total
EDAC	\$7,481.00	\$5,287.00	\$2,503.00	\$804.00	<b>\$16,075.00</b>
Andrews Labor	\$2,700.00	\$2,600.00	\$2,500.00		<b>\$7,800.00</b>
Andrews Expenses	\$830.00	\$749.00	\$575.00		<b>\$2,154.00</b>
<b>Total</b>	<b>\$11,011.00</b>	<b>\$8,636.00</b>	<b>\$5,578.00</b>	<b>\$804.00</b>	<b>\$26,029.00</b>

Town administration sought to compel Andrews to manage the subcontractor in this work. Administration negotiated a 5% management fee on the subcontractor's activities payable to Andrews Engineering. This is the \$804 Management Fee you see in the table above. Were the Town's contract engineer to manage this activity, the cost would be significantly more.

Adequate funds are available in the Solid Waste Fund (623) under the Engineering Services account (63012).

**Recommendation:**

Authorize the Town Manager to enter into an agreement with Andrews Engineering for the removal and replacement of monitoring wells.

# EXHIBIT 1



## LEGEND

MW-5R	EXISTING GROUND WATER MONITORING WELL OR PIEZOMETER LOCATION	—	FACILITY PROPERTY BOUNDARY
GP-12	AS-BUILT GAS PROBE LOCATION	—	SOLID WASTE BOUNDARY
BG-17	BANG-BAR MONITORING LOCATION	—	PROPOSED GAS EXTRACTION LINE
●	STRUCTURE MONITORING LOCATION	—	PROPOSED GAS EXTRACTION WELL
—	10-FT CONTOUR INTERVAL (FT. MSL)	—	SURFACE WATER BODY
		—	LEACHATE LINE

## NOTES

1. LIMITS OF SOLID WASTE FOR OLD LANDFILL BASED ON INFORMATION PROVIDED BY LANDFILL PERSONNEL AND LIMITED SOIL EXCAVATIONS. LIMITS OF SOLID WASTE IN WEST CELLS BASED ON CELL CONSTRUCTION SURVEYS.
2. ALL PONDS FOR THE GOLF COURSE TO BE LOCATED OUTSIDE THE SOLID WASTE BOUNDARY IN EXISTING DRAINAGE AREAS.
3. CONTOURS FOR GOLF COURSE REFLECT ADDITIONAL CLEAN SOIL FILL FOR LANDSCAPING OF GOLF COURSE HOLES.
4. OUTLET PIPE FROM MAYNARD LAKE IS 30-INCH RDP. PIPE DISCHARGES TO HART DITCH.

200 0 200  
SCALE FEET

DATE: 11/14/2008	SITE MAP WITH AS-BUILT METHANE GAS PROBE LOCATIONS
BY: J. B. BROWN	PLANS PREPARED FOR TOWN OF MUNSTER LANDFILL, MUNSTER, INDIANA




ANDREWS ENGINEERING, INC.  
7478 Shadeland Station Way, Indianapolis, Indiana 46256  
(317)593-8992 Fax (317)598-9929  
Pottsville, IL • Naperville, IL • Springfield, IL

APPROVED BY: TAB DESIGNED BY: EAC DRAWN BY: MWR

REVISIONS		
NO.	DATE	DESCRIPTION

# EXHIBIT 2

## KEY

MW-7  MONITORING WELL(MW)/PIEZOMETER(PZ)  
(U=upgradient monitoring well)

605 GROUND WATER LEVEL (ft./msl)

 GROUND WATER FLOW DIRECTION

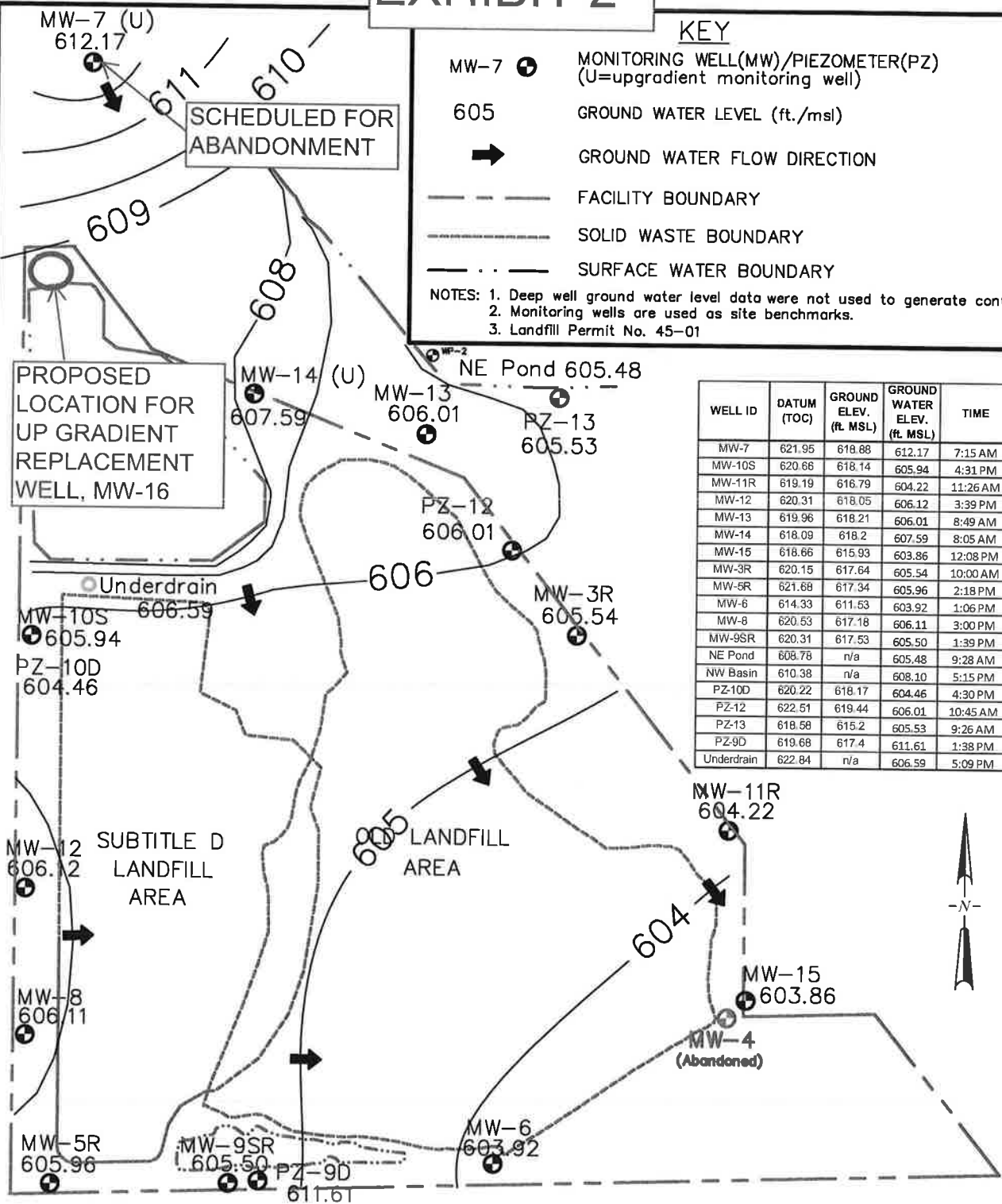
 FACILITY BOUNDARY

 SOLID WASTE BOUNDARY

 SURFACE WATER BOUNDARY

NOTES: 1. Deep well ground water level data were not used to generate contours.  
2. Monitoring wells are used as site benchmarks.  
3. Landfill Permit No. 45-01

PROPOSED  
LOCATION FOR  
UP GRADIENT  
REPLACEMENT  
WELL, MW-16



WELL ID	DATUM (TOC)	GROUND ELEV. (ft. MSL)	GROUND WATER ELEV. (ft. MSL)	TIME
MW-7	621.95	618.88	612.17	7:15 AM
MW-10S	620.66	618.14	605.94	4:31 PM
MW-11R	619.19	616.79	604.22	11:26 AM
MW-12	620.31	618.05	606.12	3:39 PM
MW-13	619.96	618.21	606.01	8:49 AM
MW-14	618.09	618.2	607.59	8:05 AM
MW-15	618.66	615.93	603.86	12:08 PM
MW-3R	620.15	617.64	605.54	10:00 AM
MW-5R	621.68	617.34	605.96	2:18 PM
MW-6	614.33	611.63	603.92	1:06 PM
MW-8	620.53	617.18	606.11	3:00 PM
MW-9SR	620.31	617.53	605.50	1:39 PM
NE Pond	608.78	n/a	605.48	9:28 AM
NW Basin	610.38	n/a	608.10	5:15 PM
PZ-10D	620.22	618.17	604.46	4:30 PM
PZ-12	622.51	619.44	606.01	10:45 AM
PZ-13	618.58	615.2	605.53	9:26 AM
PZ-9D	619.68	617.4	611.61	1:38 PM
Underdrain	622.84	n/a	606.59	5:09 PM



ANDREWS ENGINEERING INC.  
INDIANAPOLIS, INDIANA 46250

TOWN OF MUNSTER LANDFILL, LAKE COUNTY, IND.  
POTENTIOMETRIC MAP - April 14, 2015

DRAWN BY: AJH DATE: 6/8/2015  
DESIGNED BY: SEG PROJECT # 95-419  
APPROVED BY: SPR FILE #95419608.dwg

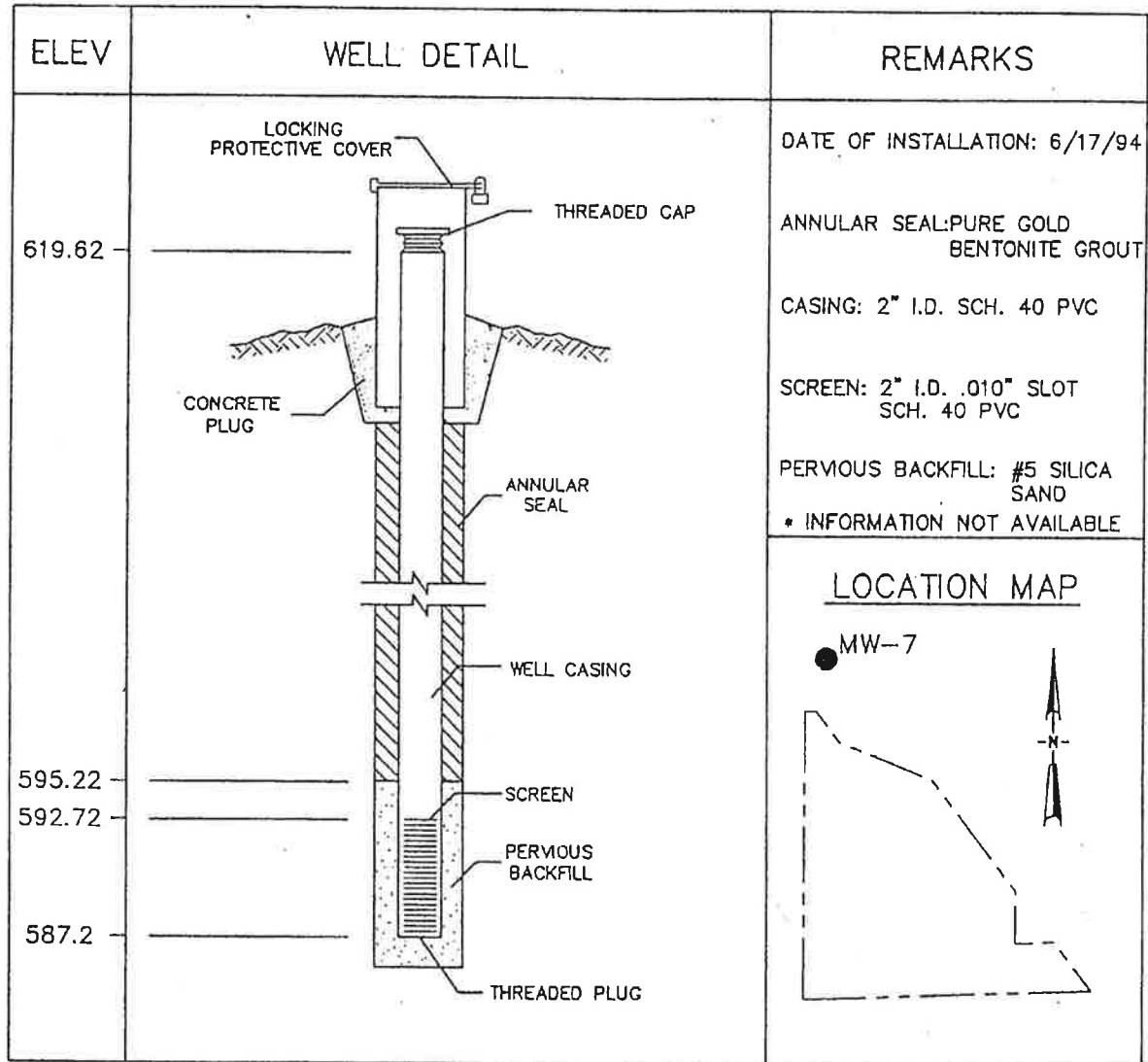
FIGURE

1

0 500  
SCALE FEET

# EXHIBIT 3

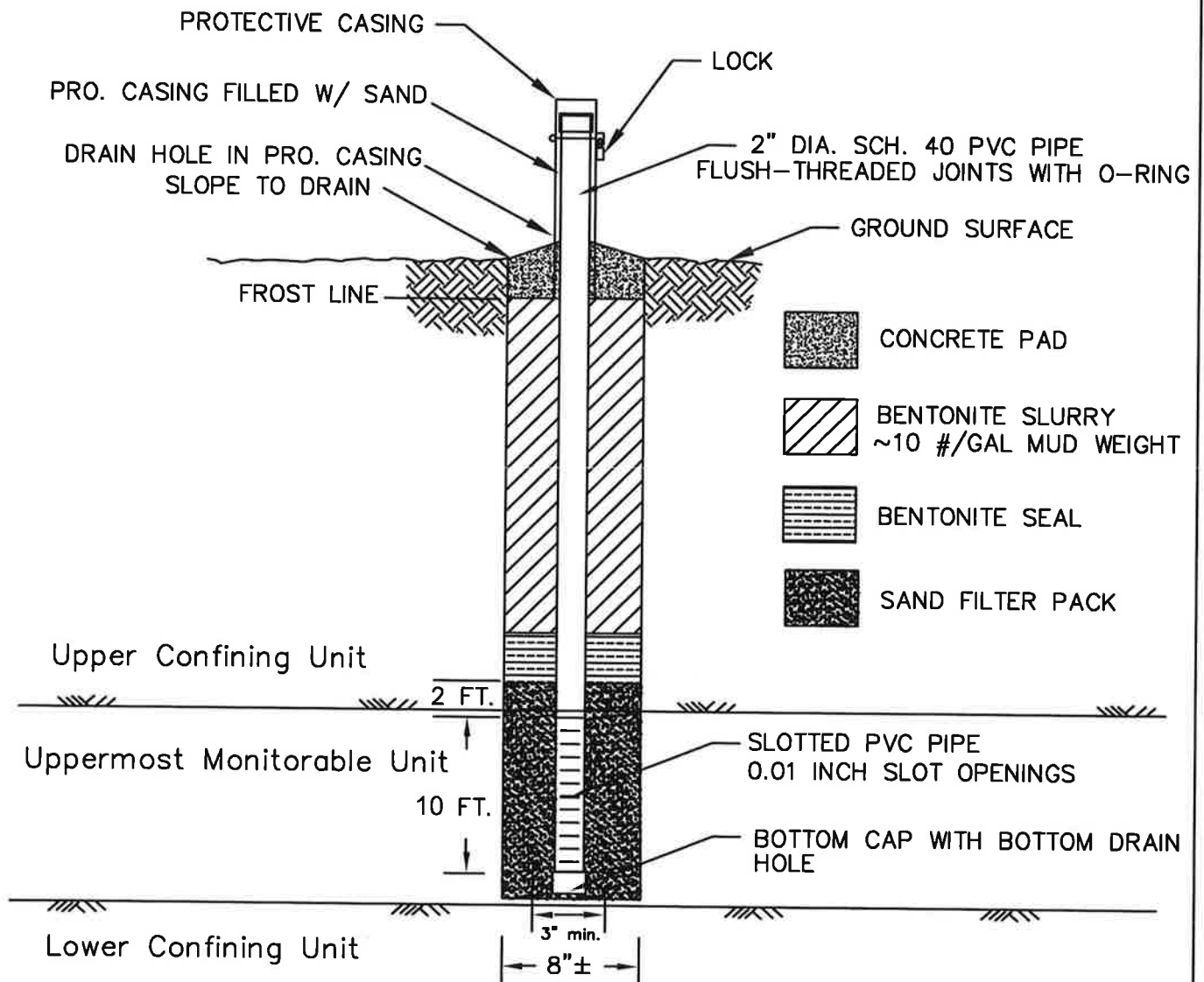
WELL IDENTIFICATION: MW-7



DATE 3/28/95  
 DWN. DWB  
 APPR \_\_\_\_\_  
 REVS \_\_\_\_\_  
 PROJECT NO.  
 15024.20

TOWN OF MUNSTER LANDFILL  
 MUNSTER, INDIANA

**MONITORING WELL DETAIL**



## MONITORING WELL

(not to scale)



ANDREWS ENVIRONMENTAL ENGINEERING INC.  
INDIANAPOLIS, INDIANA 46250

### TYPICAL MONITORING WELL

DRAWN BY:	MKN	DATE:	5/28/15
DESIGNED BY:	TAB	PROJECT #	150108/0001
APPROVED BY:	TAB	FILE #	95407183.DWG

**EXHIBIT**

**4**

September 3, 2015

Mr. Dustin Anderson  
Munster Town Hall  
1005 Ridge Road  
Munster, Indiana 46231

RE: Gas Investigation, Gas Vents, and Replacement Monitoring Well  
Town of Munster Landfill, Lake County

Dear Mr. Anderson:

With regard to the above subject work tasks, we obtained another drilling estimate from a firm we have used often in the past – EDAC from Holland, Michigan. We asked them to give a quote for the gas investigation probes, gas vents, and abandon/replace MW-7. (MW-7 is located in the northern part of the site). The driller's quote is enclosed. I've separated out the estimated amounts for each portion for comparison to earlier drilling estimates and the breakdown is as follows:

Gas investigation boreholes: \$7,500  
Gas Vents: \$5,300  
MW-7 (abandon and replace: \$2,510

Other drilling firms bid from \$8,000 to \$9,000 for the gas investigation boreholes alone, so EDAC's quote is better in that regard. EDAC's estimate for the gas vents is a little high since they assumed 25 feet deep and we are not likely to go much deeper than 12 feet or so. However, we should allow for a contingency in case we have to move drilling locations if we run into large rubble, so the estimate as it stands is reasonable. If the driller invoices through Andrews, there will be a markup of these costs.

A summary cost table including Andrews' portion of labor and expenses (management, oversight, and documentation) is provided below:

	Gas Investigation	Gas Vents**	MW-7 Abandonment and Relocation <sup>#</sup>	Total
<b>Driller*</b>	\$7,875	\$5,565	\$2,635	<b>\$16,075</b>
<b>Andrews Labor</b>	\$2,700	\$2,600	\$2,500	<b>\$7,800</b>
<b>Andrews Expenses</b>	\$830	\$749	\$575	<b>\$2,154</b>
<b>Total</b>	<b>\$11,405</b>	<b>\$8,914</b>	<b>\$5,710</b>	<b>\$26,029</b>

\*These costs assumes 5% markup for invoicing through Andrews Eng., Inc.

\*\* Andrews labor and expenses for this category include horizontal and vertical survey after completion.

<sup>#</sup> Andrews labor and expenses for this category include documentation to request IDEM approval of abandonment and relocation, plus horizontal and vertical survey after completion.

Mr. Dustin Anderson  
Town of Munster

September 3, 2015  
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The above cost estimate assumes that all three task categories are conducted during the same site visit, which saves on travel and mobilization costs. In order to conduct the MW-7 abandonment and relocation task during the same time, we should request approval from IDEM soon.

EDAC estimates that field time for the investigation and installations will be 4 days. As with any drilling project, delays may occur due to weather, equipment failure, and other issues beyond our control. If such an event occurs, additional costs shall be invoiced pursuant to our standard schedule of charges for labor and expenses.

If you are in agreement with this scope of work and cost estimate please authorize and we will proceed immediately. If you have any questions or comments, don't hesitate to call me at 317-595-6492, ext. 2412 or 317-372-4640, or by e-mail at [tbannister@andrews-eng.com](mailto:tbannister@andrews-eng.com).

Sincerely,



Timothy A. Bannister, LPG #1850  
Senior Hydrogeologist

Enc. EDAC drilling estimate

cc: Mr. Rod Potts, Town of Munster (via email w/ Enc.)  
Mr. Craig Hendrix, SEH of Indiana (via email w/ Enc.)



# EDAC

## Environmental Drilling and Contracting Inc.

4692 136<sup>th</sup> Avenue, Holland, MI 49424 (616)738-9300, FAX (616)738-8135

July 5, 2015

Mr. Arron Hacker  
Andrews Engineering Inc.  
7172 Gram Road, Suite 125  
Indianapolis, IN 46250

Re: Munster Landfill Site  
Munster, IN  
**Drilling Proposal**

Dear Mr. Hacker,

Per your request and specifications, EDAC is pleased to quote as follows:

Scope of Work: REF: Request for Quotation dated 7/25/15

**15ea., Temporary Gas Probes:** 12-15' depth, drill & set 1" PVC screen to within 3' of surface, filter sand screen interval with bentonite chip seal. Leave in place for sampling. Pull well & abandon open boring with bentonite chips.

**3ea. Gas Vent Wells:** 25' depth, no sampling, drill & set 4" PVC Sch80 screen within 3' of surface, 4" PVC Sch80 riser extended 10' above ground, pea gravel, 2' bentonite seal, and install 4" Galv Turbine ventilator.

**1 ea., Monitor Well:** 34' depth, continuous split spoon sample, set well with 2"x5' PVC screen, 2" PVC riser, Stickup protector w/ 2" locking cap & concrete pad.

- Notes:**
1. Drill Rig: Gus Pech GP1100 ATV  
Drilling Method: 4 1/4" ID/8" OD & 12 1/4" ID/18" OD hollow stem auger  
Drilling conditions: thru waste
  2. Drill crew: 2 men, Union Site
  3. Screen: 4" PVC w/ 4 vertical rows 3/8" dia holes spaced 3"
  4. Drill cuttings: EDAC to leave cuttings onsite at well location.  
Andrews responsible for collection & disposal.
  5. Duration: 4 work days  
Schedule: July/August 2015

Description	Estimated Quantity	Unit Price	Total Cost
Mobilization/Demobilization	1 Each	\$ 1200/ea	\$ 1,200.00
Drilling w/4 1/4" H.S.A. 0-50'	259 Feet	\$ 10/ft	\$ 2,590.00
Split Spoon Samples 2" x 24" 0-50'	17 Each	\$ 15/ea	\$ 255.00
Drilling w/12 1/4" H.S.A. 0-50'	45 Feet	\$ 25/ft	\$ 1,125.00
Well Construction & Abandonment	6 Hours	\$ 170/hr	\$ 1,020.00
Screen 4" x 12' PVC, sch80 3/8" dia holes	3 Each	\$ 350/ea	\$ 1,050.00
Casing 4" PVC, sch80	60 Feet	\$ 10/ft	\$ 600.00
Cap 4" PVC	3 Each	\$ 12/ea	\$ 36.00
Coupling 4" PVC	3 Each	\$ 19/ea	\$ 57.00
Screen 1" x 10' PVC Sch40 10 slot	22 Each	\$ 60.00/ea	\$ 1,320.00
Casing 1" PVC Sch40	80 Feet	\$ 3.00/ft	\$ 240.00
Screen 2" x 5' PVC Sch40 10 slot	1 Each	\$ 55.00/ea	\$ 55.00
Casing 2" PVC Sch40	35 Feet	\$ 3.50/ft	\$ 122.50
Filter: KE#1	135 Each	\$ 9.00/ea	\$ 1,215.00
Bentonite grout: Quik Grout w/ 20% solids	3 Each	\$ 25.00/ea	\$ 75.00
Gravel #8, 50lb bag	100 Each	\$ 9/ea	\$ 900.00
Bentonite Chips	30 Each	\$ 14/ea	\$ 420.00
Turbine Ventilator: 4" Galv internally braced	3 Each	\$ 95/ea	\$ 285.00
Stick-up Protector: 4" x 5' cs	1 Each	\$ 165/ea	\$ 165.00
Locking Cap: 2"	1 Each	\$ 30/ea	\$ 30.00
Loader-backhoe: case 580	0 Week	\$ 1700/wk	\$ 0.00
Decon, access, setup, haul water & site cleanup	7 Hours	\$ 140/hr	\$ 980.00
Steam Cleaner/Generator	4 Days	\$ 130/dy	\$ 520.00

Development	1 Hours	\$150.00/hr	\$	150.00
Development Pump	1 Day	\$100.00/dy	\$	100.00
Standby Time		\$ 160/hr	\$	.00
Travel Expenses per 2 man crew	4 Day	\$ 200/dy	\$	800.00
<b>ESTIMATED TOTAL:</b>				<b>\$15,310.50</b>

The number of units described above are estimates only and may be adjusted based on actual quantities. Trusting the above meets your approval, please contact this office with any questions.

Sincerely,

Kirk Johnson  
President